Progress in Nuclear Masses

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Different types of experimental data require different procedures for collection and for evaluation. In nuclear physics in particular, we might be interested in data on nuclear levels, their energies, their gamma decays. These data are collected and evaluated "vertically" in a network worldwide (ENSDF). I am more directly concerned with the evaluation of the masses of nuclei, more precisely their atomic masses, in what we call the Atomic Mass Evaluation (AME). And also, directly connected to the masses, by the properties of ground-states and long-lived isomers of nuclei, their spins, half-lives, excitation energies and decay modes, called the NUBASE evaluation. Masses as well as nuclear and decay properties have in common to require "horizontal" collection and evaluation.

After developing some general ideas about evaluations and explaining the various concepts above, I will describe the most prominent features of the AME, the reasons for its complexity, how they are faced and solved. I will explain why it was found essential to create the NUBASE evaluation and how we finally succeeded in having AME and NUBASE co-ordinated and finally published for the first time together last December.

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